Cisco MDS Data Mobility Manager: Streamlined Data Migration

With storage requirements more than doubling every year, storage administrators are challenged to streamline their operations. This streamlining includes the adoption and introduction of new array technologies and the movement of data to different tiers of storage so that storage resources are optimally deployed. The amount of data that needs to be moved is significant enough that data mobility ranks in the top five of most surveys of storage administrators' concerns.

Several solutions are available today that can help a storage administrator address the data migration task. The solutions can broadly be characterized into host-, storage-, and appliance-based approaches. Each of the existing approaches has its benefits and drawbacks.

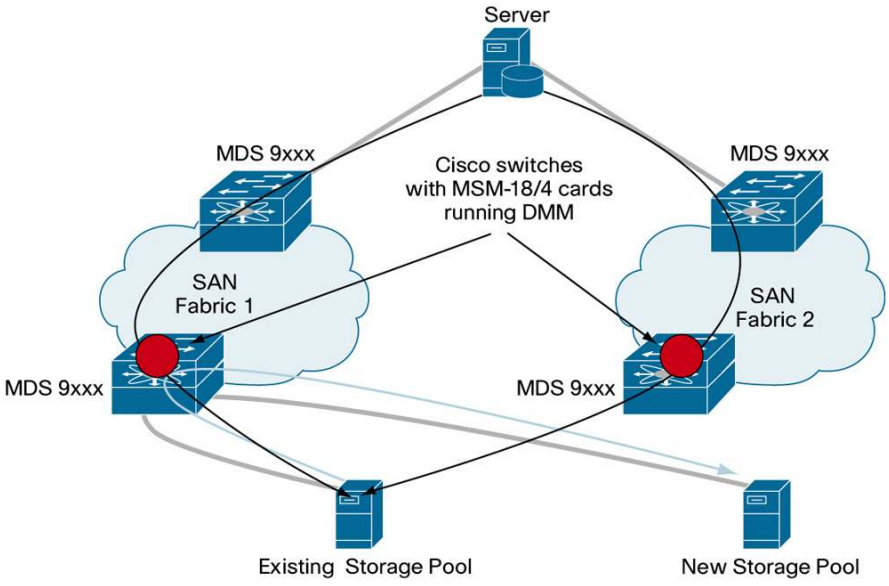
A customer's preference for a particular solution depends on the weight that customer assigns to the solution's advantages and disadvantages. However, in some scenarios, the downside of the existing approaches outweigh the upsides. For these scenarios, Cisco® MDS Data Mobility Manager (DMM) provides a solution.

Cisco MDS DMM is typically a beneficial solution in an organization in which the IT group is partitioned into systems and database administrators and storage administrators, and the storage administrators want complete control of the migration task to avoid dependency on systems or database administrators or storage vendor customer support engineers.

Commonly available data suggests that storage administrators who have to depend of systems or database administrators or storage vendor support engineers take four times the amount of time it should take to complete a migration task. Cisco MDS DMM allows a storage administrator or migration service provider to complete the migration with minimal coordination across the different teams (server, application, etc.) that support the different parts of a data center.

Figure 1 shows a typical deployment of Cisco MDS DMM in the storage area network (SAN) fabric.

Figure 1. Fabric-Based Cisco MDS Data Mobility Manager



Cisco MDS DMM offers these main features:

- **Capability to migrate data from existing storage to new storage without any reconfiguration of the server, target device, or SAN:** Neither the server nor the existing storage device sees the insertion of the Cisco DMM service. This transparent insertion of service is advantageous because it allows data migration to be completed with minimal coordination among the different job functions (such as systems and database administration) in a data center.
- **Migration of multiple logical unit numbers (LUNs) at the same time:** Although in theory, migration of several thousand LUNs at the same time is possible, in practice migration is likely to be limited to several hundred concurrent LUNs because of the effect of the administrative traffic on existing storage and the SAN.
- **Migration to LUNs of larger sizes:** Because migrations are triggered by capacity planning and the desire to move to new arrays that can offer larger-capacity LUNs, Cisco considered the capability to allow movement to larger LUNs extremely desirable when designing its solution.
- **Verification of migrated data:** The verification function available with Cisco MDS DMM allows the storage administrator to request a block-by-block comparison of the data in the existing storage array and the new storage array.
- **Server- and storage-level migration:** Data migration today is typically performed on a few servers at a time, to isolate any disruption to a small set of servers at a given time. Cisco MDS DMM offers two types of migration control: server level and storage level. With server-level migration, the storage administrator specifies all the initiators on a server and the respective target ports (on the storage array) that these initiators talk to (the administrator must provide the initiator and target pairs). The storage administrator can then schedule migration for all the LUNs visible to the server on the array.

  This migration can be configured and the data movement completed without any additional configuration on the server, array, or SAN. With storage-level migration, the migration is performed using the identity of an initiator specific to Cisco (and so the server initiators do not play a role in the migration); storage-level migration requires that an initiator specific to Cisco be given access to all the LUNs that need to be migrated. The benefit of this approach is that fewer migration tasks need to be configured to complete the migration task.
- **Rate control:** Because administrative traffic from migration can affect the existing target device and the SAN, the rate of migration needs to be controlled. Cisco MDS DMM allows the administrator to assign a slow, medium, or fast setting to the migration task.
- **Asynchronous migration:** Typical migration implementations use a synchronous approach so that when a server sends an I/O operation to a region that was previously migrated, new write I/O operations are synchronously written to the existing and new storage arrays. This approach precludes the use of these tools when data needs to be migrated to accommodate data center consolidation because the existing and new storage arrays may be located thousands of miles apart. Cisco MDS DMM addresses limitations in existing migration solutions available on the market by offering an asynchronous capability.
- **Configuration wizard:** An easy-to-use configuration wizard built into the Cisco Data Center Network Manager (formerly Fabric Manager) steps users through the process needed to complete a migration task. The tool also reports the status of a migration and allows the user to monitor the migration progress. In addition to the configuration wizard, a command-line interface (CLI) is available to allow advanced users to create scripts to manage migration tasks.
- **Hetrogenous Environment support:** DMM is a network service, hence its agnostic to vendor storage arrays and can easily migrate FC block data between vendor arrays.

Cisco MDS 9000 NX-OS Software Version 4.1x or higher is required to run DMM on Multi Service Module (MSM) 18/4 or MDS 9222i switch. A typical hardware configuration will employ two MSM-18/4 or two MDS 9222i switch one per network in the typical redundant SAN configuration commonly deployed. A Cisco MDS DMM license is needed for each card. The only other requirement is that the existing and new storage arrays must be directly connected to Cisco MDS 9000 family switches. The Cisco MDS DMM Interoperability matrix documents the supported host operating system, multipath software, host bus adapter (HBA), and arrays for a given release.

For More Information

To learn more about Cisco storage solutions for the data center, visit http://www.cisco.com/go/datacenter.

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Printed in USA C78-421102-02 03/11